ONTARIO MINISTRY OF ENVIRONMENT
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## OPERATING SUMMARY

# 1973

# BURLINGTON-SKYWAY

## WATER POLLUTION CONTROL PLANT

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Burlington ~ Skyway : water pollution control plant.

81586

Ontario

MINISTRY OF THE ENVIRONMENT

MINISTER
Honourable William G. Newman

DEPUTY MINISTER
E. Biggs

ASSISTANT DEPUTY MINISTER
REGIONAL OPERATIONS
J. Barr

REGIONAL OPERATIONS DIVISION

DIRECTOR, CENTRAL REGION
P. Cockburn

MANAGER, UTILITY OPERATIONS
A. Thomas

# BURLINGTON-SKYWAY
# WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF BURLINGTON

by the
MINISTRY OF THE ENVIRONMENT

## 1973 ANNUAL OPERATING SUMMARY

prepared by
Plant Performance Unit
TECHNICAL SERVICES BRANCH
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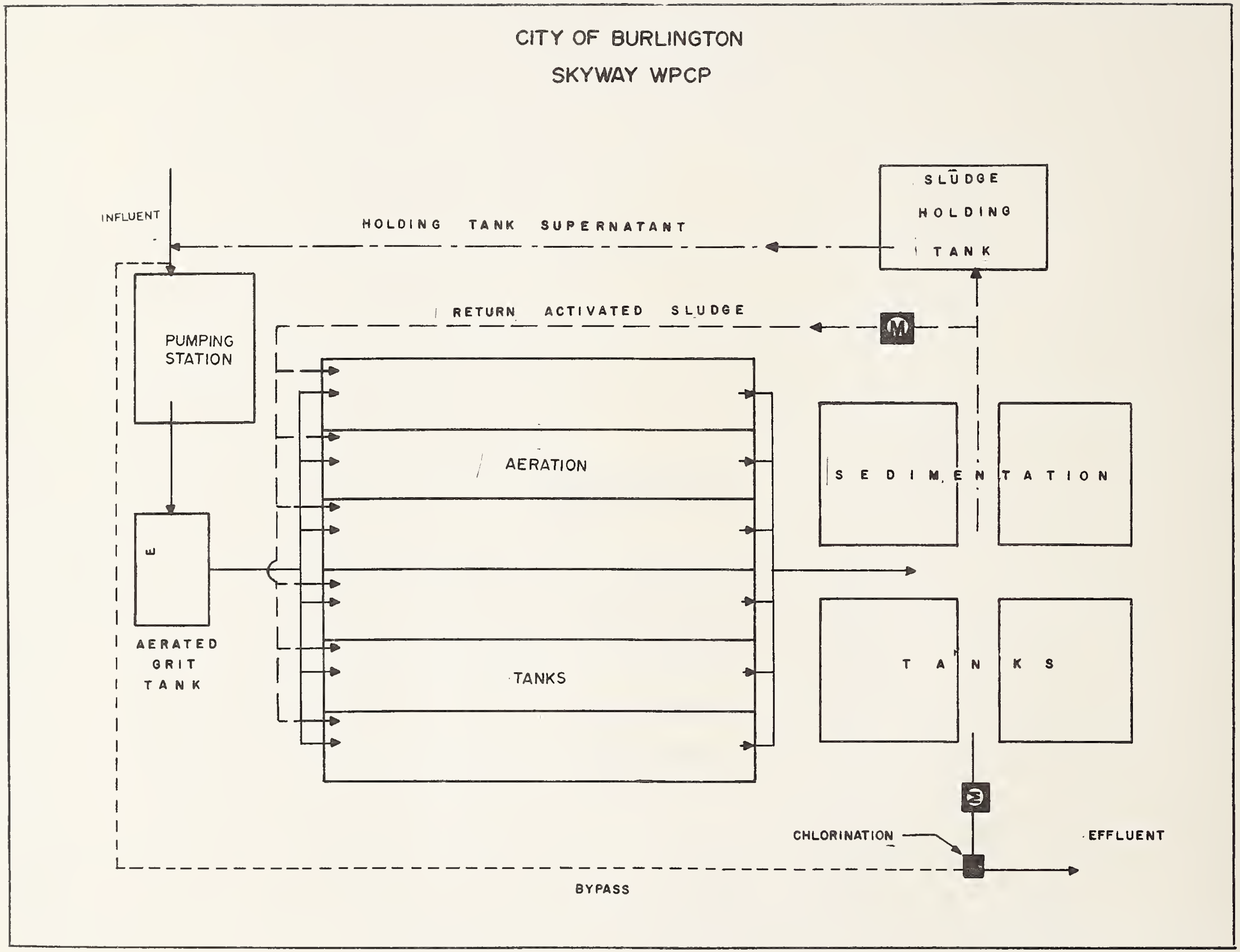

CITY OF BURLINGTON
SKYWAY WPCP
INFLUENT
HOLDING TANK SUPERNATANT
SLUDGE HOLDING TANK
RETURN ACTIVATED SLUDGE
M
PUMPING STATION
AERATION
TANKS
SEDIMENTATION
TANKS
AERATED GRIT TANK
M
CHLORINATION
EFFLUENT
BYPASS

# DESIGN DATA

| | |
|---|---|
| PROJECT | City of Burlington<br>Skyway WPCP |
| PROJECT NO. | 2-0105-62 |
| DESIGN FLOW | 6 mgd |
| BOD - Raw Sewage | 200 mg/l |
| SS - Raw Sewage | 200 mg/l |

## PRETREATMENT

### Coarse Screening

Type: Link Belt, mechanically-cleaned
Size: $2\frac{1}{2}$" space

### Lift Station Pumps (@ 30' tdh)

2 @ 6 mgd each; 2 @ 5 mgd each

### Screening

Type: Link Belt, mechanically-cleaned
Size: 1" space

### Grit Removal

Type: Air degritter
Size: One 20.3' x 25' x 14.2'
Retention: 20.8 min

## SECONDARY TREATMENT

### Aeration Tanks

Type: Diffused air, single pass
Size: Six 270' x 27' x 15'
(660,300 ft. or 4.12 mil gal)
Retention: 16.5 hr
Loading: 9.5 lb BOD/1000 $ft^3$

### Air Supply

Type: Hoffman multi-stage centrifugal blowers
Size: 3-4000 cfm (max), 1-6000 (max)

### Diffusers

Type: Saran-covered flexofusers
Spacing: 250 tubes per tank

### Secondary Sedimentation

Type: Eimco
Size: Four 60' x 60' x 12' swd
(538,000 gal)
Retention: 4.1 hours
Loading: Surface, 434 gal/$ft^2$/day
Weir, 7,100 gal/ft/day

## CHLORINATION

Type: Fischer & Porter
Size: Two 2000 lb/day

### Chlorine Contact Chamber

- nil
- chlorination in outfall

## OUTFALL

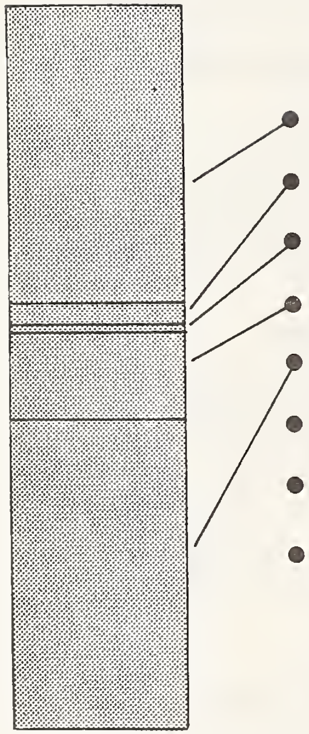
- to Hamilton Harbour

## SLUDGE HANDLING

Type: Thickening tank, decanted
Size: One 20' dia x 9' depth
(2830 $ft^3$ or 1760 gal)

# ANNUAL COSTS

## 1973 OPERATING COSTS



| | |
|---|---|
| SALARIES & WAGES | 41 % |
| EMPLOYEE BENEFITS | 3 % |
| TRANSPORTATION & COMMUNICATIONS | 1 % |
| SERVICES | 12 % |
| SUPPLIES & EQUIPMENT | 43 % |
| AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS | NIL |
| TRANSFER PAYMENTS | NIL |
| OTHER TRANSACTIONS | NIL |

### YEARLY OPERATING COSTS

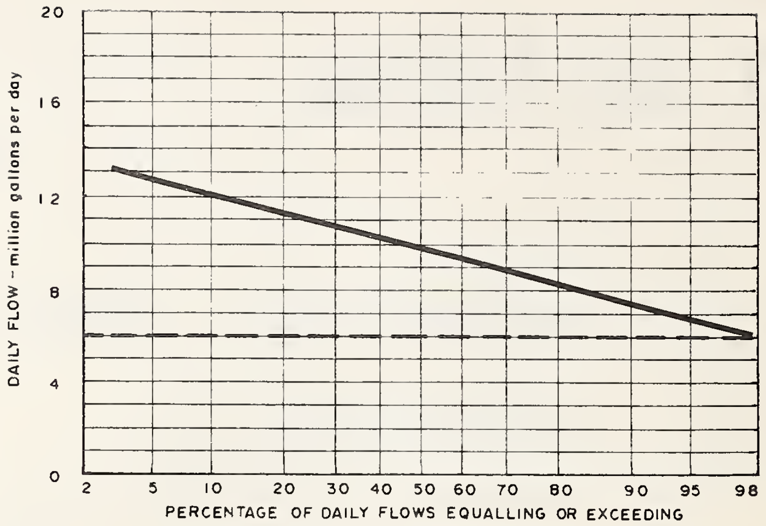
| YEAR | SEWAGE TREATED in million gallons | TOTAL OPERATING COSTS | UNIT COSTS | |
|---|---|---|---|---|
| | | | $/M.G. | ¢/lb BOD |
| 1968 | 1365 | $ 69,386 | 51 | 4 |
| 1969 | 1218 | 80,952 | 66 | 5 |
| 1970 | 1500 | 103,062 | 69 | 5 |
| 1971 | 2058 | 106,922 | 52 | 2 |
| 1972 | 2948 | 127,078 | 43 | 2 |
| 1973 | 3433 | 158,874 | 46 | 4 |

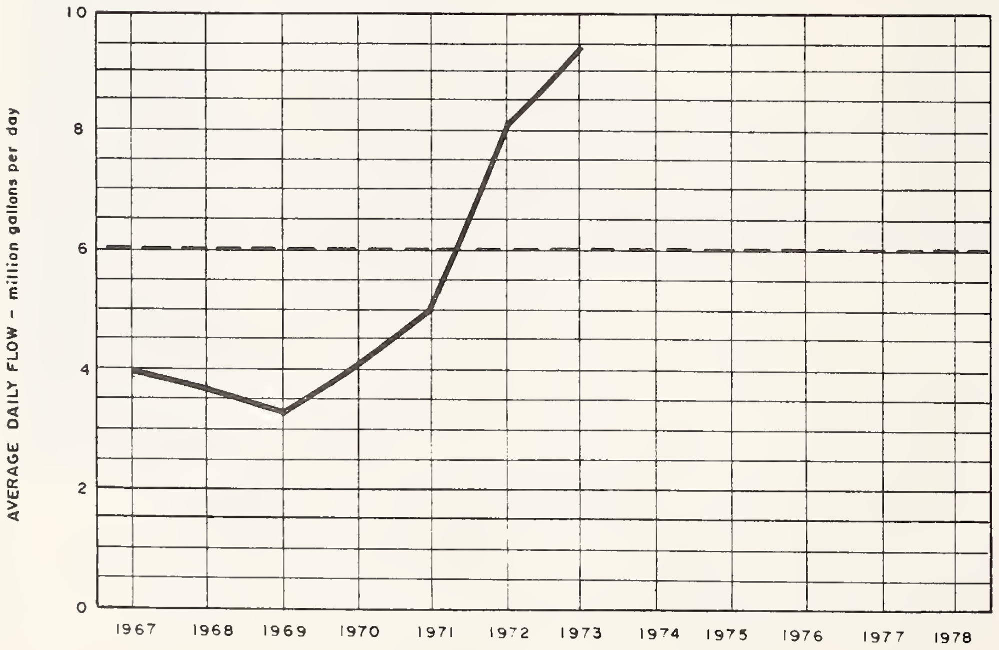
# OPERATING EXPENDITURES

| | |
|---|---|
| SALARIES AND WAGES | $64,855 |
| EMPLOYEE BENEFITS | 5,445 |
| TRANSPORTATION & COMMUNICATIONS | 967 |
| SERVICES | 19,649 |
| SUPPLIES AND EQUIPMENT | 67,958 |
| ACQUISITION/CONSTRUCTION OF PHYSICAL ASSETS | 0 |
| TRANSFER PAYMENTS | 0 |
| OTHER TRANSACTIONS | 0 |
| TOTAL | $158,874 |

## PROCESS DATA

# FLOWS





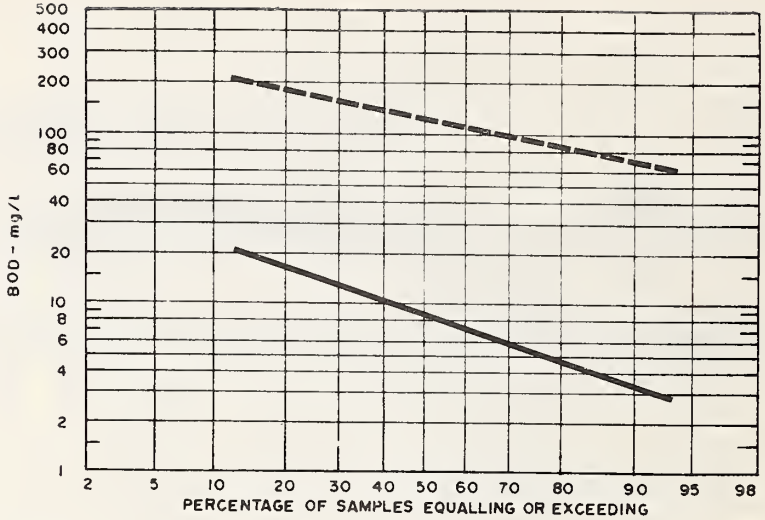
DESIGN CAPACITY – – – – – – –

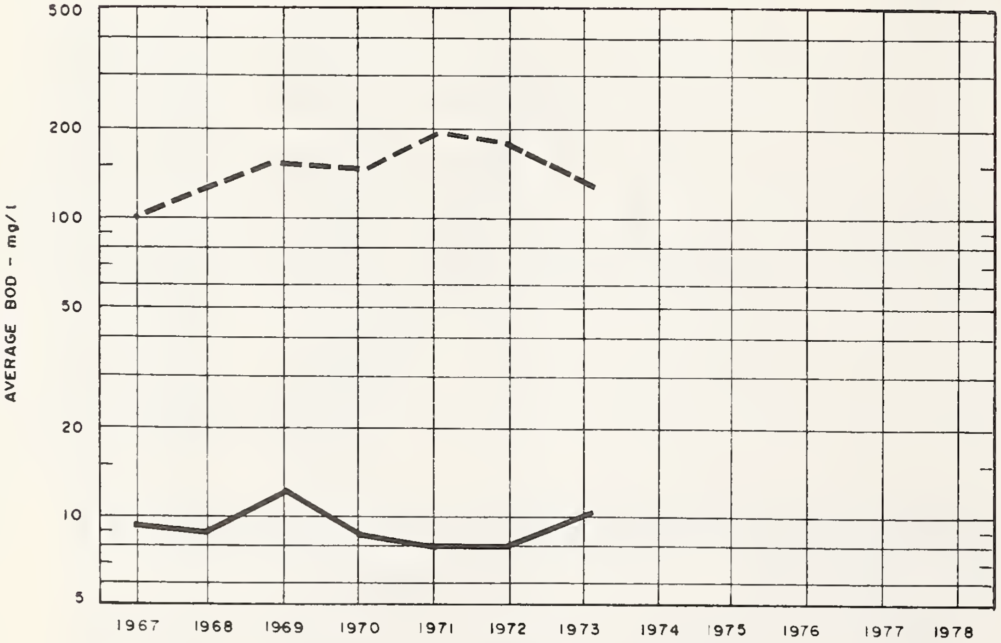
# PLANT PERFORMANCE

| MONTH | FLOWS | | | BIOCHEMICAL OXYGEN DEMAND | | | | SUSPENDED SOLIDS | | | | PHOSPHORUS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL FLOW million gallons | AVERAGE DAY mil. gal | MAXIMUM DAY mgd | INFLUENT mg/l | EFFLUENT mg/l | REDUCTION | | INFLUENT mg/l | EFFLUENT mg/l | REDUCTION | | INFLUENT mg/l P | EFFLUENT mg/l P |
| | | | | | | % | $10^5$ pounds | | | % | $10^5$ pounds | | |
| JAN | 330 | 10.6 | 14.2 | 120 | 8 | 93 | 4.2 | 202 | 11 | 94 | 6.3 | 5.5 | 3.5 |
| FEB | 242 | 8.6 | 12.1 | 85 | 26 | 69 | 1.4 | 145 | 15 | 90 | 3.1 | 4.6 | 2.2 |
| MAR | 292 | 9.4 | 15.2 | 100 | 7 | 93 | 2.7 | 169 | 13 | 92 | 4.5 | 4.6 | 1.7 |
| APR | 318 | 10.6 | 12.0 | 75 | 10 | 87 | 2.1 | 260 | 12 | 95 | 7.9 | 3.0 | 1.1 |
| MAY | 348 | 11.2 | 13.4 | 95 | 22 | 77 | 2.5 | 246 | 14 | 94 | 8.1 | 6.2 | 4.6 |
| JUNE | 291 | 9.7 | 12.2 | 120 | 5 | 96 | 3.3 | 430 | 13 | 97 | 12.0 | 10.0 | 0.8 |
| JULY | 270 | 8.7 | 10.6 | 170 | 6 | 96 | 4.4 | 362 | 10 | 97 | 10.0 | 6.9 | 1.3 |
| AUG | 267* | 8.6 | 11.0 | 240 | 5 | 98 | 6.3 | 350 | 15 | 96 | 8.9 | 11.0 | 3.2 |
| SEPT | 276* | 9.2 | 10.0 | 180 | 11 | 94 | 4.7 | 168 | 12 | 93 | 4.3 | 8.0 | 3.0 |
| OCT | 242* | 7.8 | 10.0 | 120 | 9 | 93 | 2.7 | 263 | 17 | 94 | 6.0 | 6.9 | 2.5 |
| NOV | 268* | 8.9 | 10.5 | 240 | 4 | 98 | 6.3 | 259 | 16 | 94 | 6.5 | 8.9 | 0.5 |
| DEC | 289* | 9.3 | 11.8 | 70 | 7 | 90 | 1.8 | 171 | 15 | 91 | 4.5 | 4.2 | 1.8 |
| TOTAL | 3433 | - | - | - | - | - | 42.4 | - | - | - | 82.2 | - | - |
| AVG. | 286 | 9.4 | MAXIMUM 15.2 | 135 | 10 | 93 | 3.5 | 241 | 14 | 94 | 6.9 | 6.7 | 2.2 |
| No. of Samples | - | - | - | 12 | 12 | - | - | 57 | 58 | - | - | 12 | 12 |

* Estimates

# BIOCHEMICAL OXYGEN DEMAND

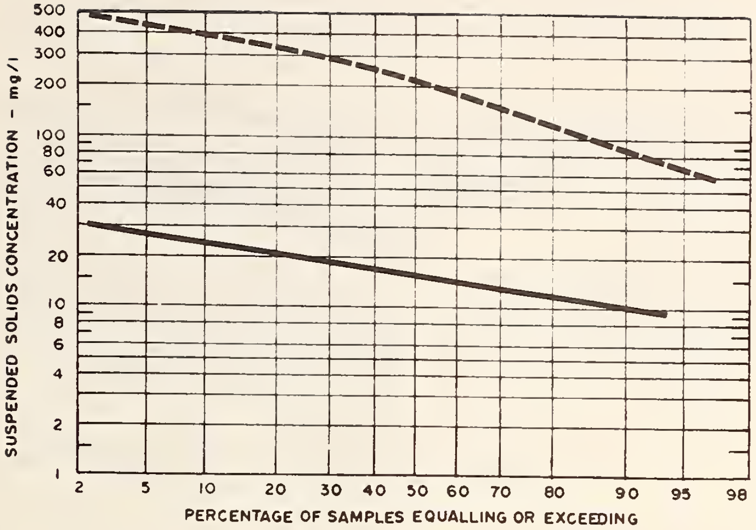


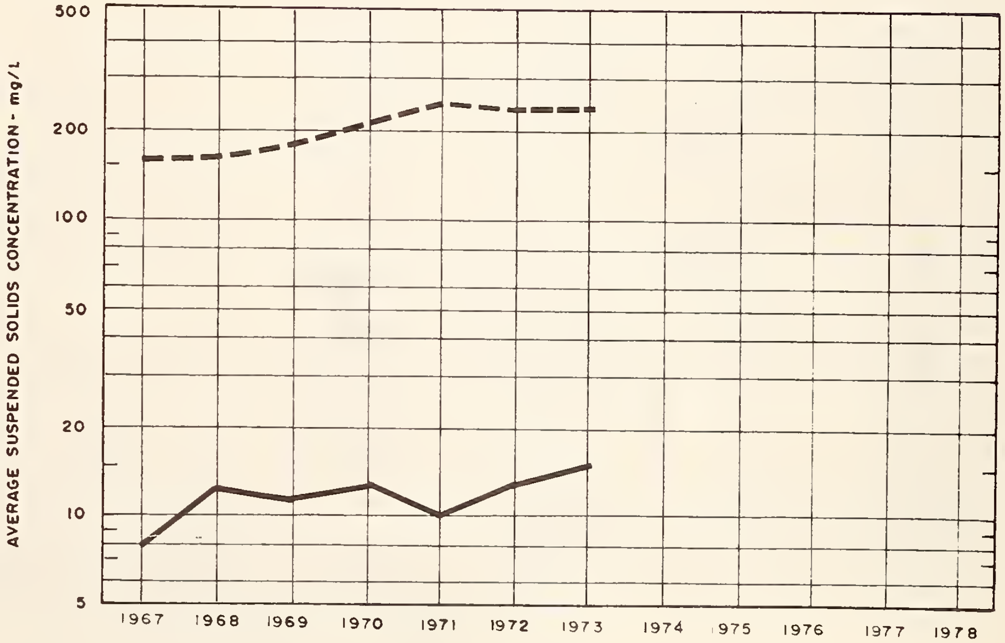


PLANT INFLUENT - - - - - - -

PLANT EFFLUENT ———————

# SUSPENDED SOLIDS

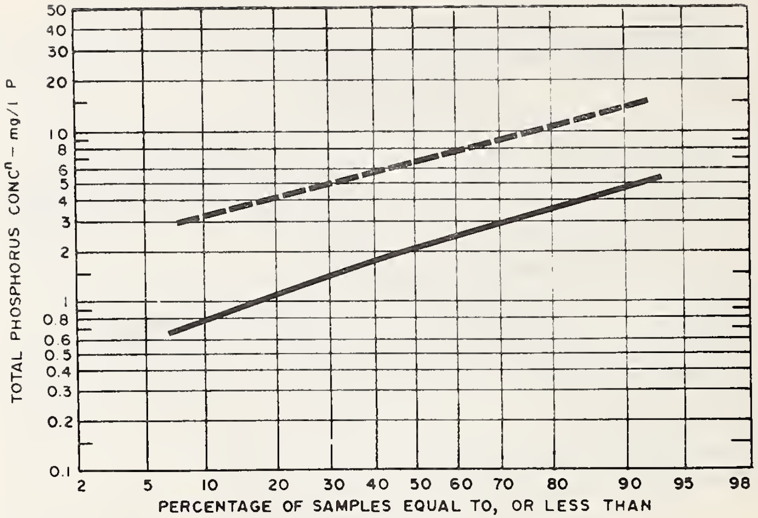


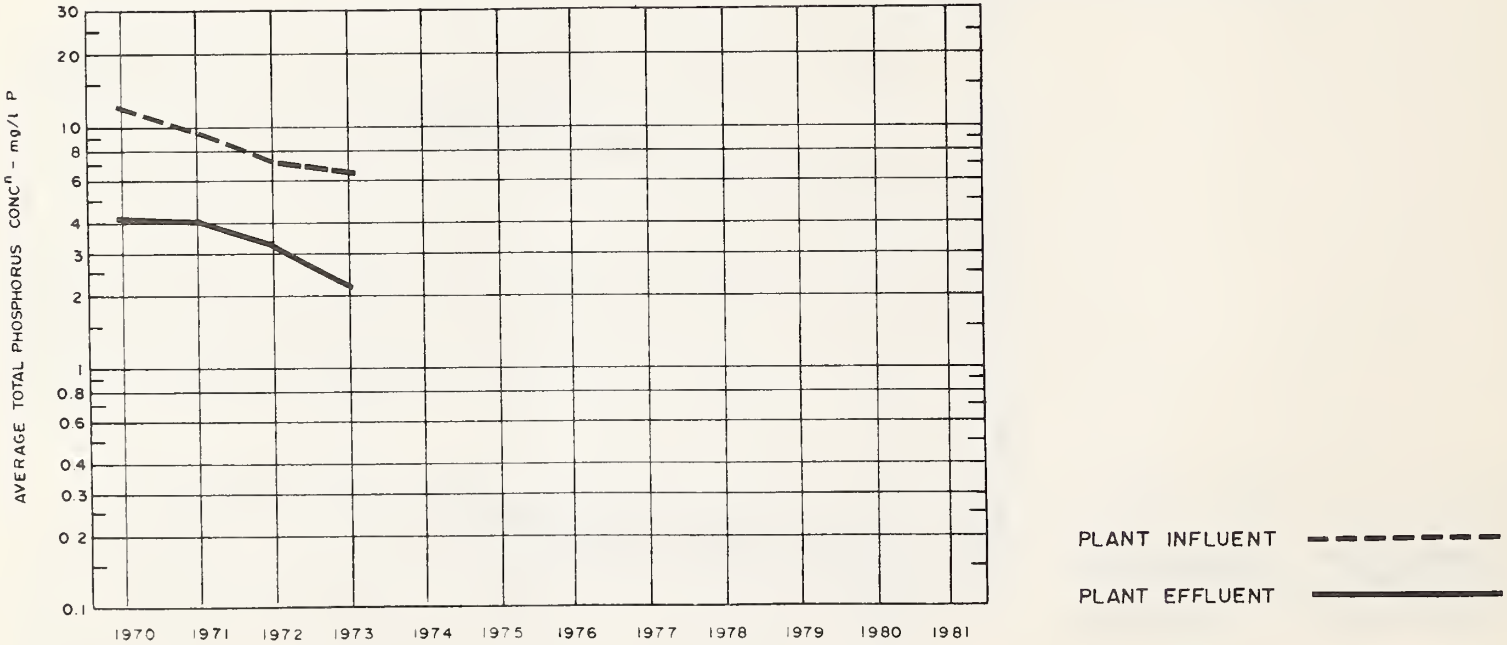


PLANT INFLUENT - - - - - - -

PLANT EFFLUENT ———————

# PHOSPHORUS


TOTAL PHOSPHORUS CONC$^n$ – mg/l P
50
40
30
20
10
8
6
5
4
3
2
1
0.8
0.6
0.5
0.4
0.3
0.2
0.1
2
5
10
20
30
40
50
60
70
80
90
95
98
PERCENTAGE OF SAMPLES EQUAL TO, OR LESS THAN


AVERAGE TOTAL PHOSPHORUS CONC$^n$ - mg/l P
30
20
10
8
6
4
3
2
1
0.8
0.6
0.4
0.3
0 2
0.1
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
PLANT INFLUENT
PLANT EFFLUENT

# TREATMENT DATA

| | GRIT | CHLORINATION | | AERATION | | | WASTE SLUDGE | | | HOLDING TANK | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MONTH | QUANTITY REMOVED cubic feet | $Cl_2$ USED $10^3$ pounds | AVG. DOSAGE mg/l | MLSS CONC mg/l | F/M $day^{-1}$ | AIR USED $\frac{1000\ ft^3}{lb\ BOD}$ | QUANTITY 10 gallons | SUSPENDED SOLIDS mg/l | VOL. SOLIDS % | QUANTITY REMOVED $10^5$ gallons | TOTAL SOLIDS % | VOL SOLIDS % | AMOUNT HAULED cubic yards |
| JAN | 580 | 0.6* | | 4200 | 0.07 | 0.5 | | 8400 | 60 | 2.4 | 1.6 | | 1407 |
| FEB | 600 | 0.8* | | 4100 | 0.08 | 0.3 | | 9000 | 63 | 2.0 | 1.7 | | 1167 |
| MAR | 420 | 4.3* | | 4400 | 0.09 | 1.2 | | 13000 | 65 | 2.3 | 2.0 | | 1342 |
| APR | 200 | 1.7* | | 4800 | 0.05 | 3.0 | | 13000 | 52 | 2.5 | 1.8 | | 1456 |
| MAY | 330 | 3.5* | 1.8 | 4000 | 0.10 | 2.8 | | 8800 | | 2.3 | 1.6 | | 1370 |
| JUNE | 1050 | 7.4 | 2.5 | 5000 | 0.08 | 2.1 | | 8400 | 62 | 2.8 | 1.6 | | 1642 |
| JULY | 450 | 6.7 | 2.5 | 8000 | 0.06 | 1.6 | | 15000 | 56 | 2.8 | 2.2 | | 1674 |
| AUG | 840 | 5.8 | 2.2 | 7200 | 0.08 | 1.1 | | 16000 | 47 | 1.6 | 3.0 | 65 | 962 |
| SEPT | 400 | 5.8 | 2.1 | 5100 | 0.10 | 1.0 | | 10000 | 57 | 1.8 | 3.0 | | 1056 |
| OCT. | 200 | 2.8 | 1.2 | 4600 | 0.06 | 2.0 | | 13000 | 57 | 1.0 | 2.1 | | 574 |
| NOV | 1070 | 0.6* | | 4200 | 0.18 | 0.8 | | 12000 | 57 | 2.0 | | | 1158 |
| DEC | 100 | 0.4* | | 3300 | 0.05 | 2.6 | | 9000 | 60 | 1.5 | | | 903 |
| TOTAL | 6240 | 40.7 | – | – | – | – | | – | – | 25.0 | – | – | 14711 |
| AVG. | 1.8 cu. ft/mil gal | | 2.2 | 4900 | 0.08 | 1.6 | | 11000 | 58 | 2.1 | 2.1 | 65 | 1226 |

* Chlorination of bypassed flows.

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TD227/B87/S69/W38/1973/MOE

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